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(54) Variable displacement compressor and displacement control valve for variable displacement compressor

(57) A valve element 21 controlling refrigerant flow from a discharge chamber into a pressure-regulating chamber by reducing discharge pressure P_d to pressure P_{c1} , and a valve element 22 controlling refrigerant flow under pressure P_{c2} from the pressure-regulating chamber into a suction chamber open and close in an interlocked fashion. A solenoid section applies solenoid force corresponding to a predetermined differential pressure valve to valve elements 21, 22. Either valve element 21 fully opens, while valve element 22 fully closes, or valve element 21 fully closes, and valve element 22 fully opens. Transitions between operating capacities can be performed rapidly. Valve element 21 is integral with a central shaft 25 for sensing pressure. Valve element 22 abuts the central shaft. The difference between the pressure-receiving areas of the valve elements 21, 22 and of the central shaft 25 is small to achieve a small effective pressure-receiving area for the valve elements 21, 22 to reduce the solenoid force for controlling the valve elements 21, 22.

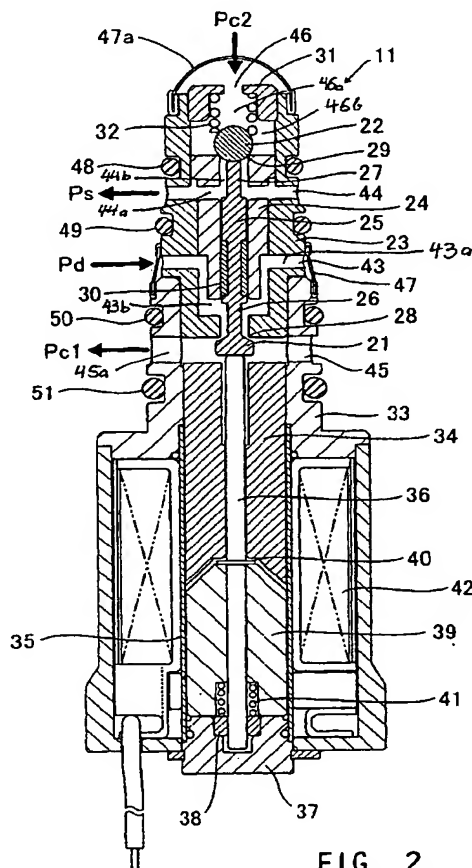


FIG. 2



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EUROPEAN SEARCH REPORT

Application Number
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DOCUMENTS CONSIDERED TO BE RELEVANT			
Category	Citation of document with indication, where appropriate, of relevant passages	Relevant to claim	CLASSIFICATION OF THE APPLICATION (Int.Cl.7)
X	EP 1 081 378 A (TOYODA AUTOMATIC LOOM WORKS) 7 March 2001 (2001-03-07) * paragraph [0011] - paragraph [0012] *	1-22	F04B27/18
X	& EP 1 033 489 A (TOYODA AUTOMATIC LOOM WORKS) 6 September 2000 (2000-09-06) * paragraph [0017] - paragraph [0018] *	1,7	
A	US 6 010 312 A (NAGAI HIROYUKI ET AL) 4 January 2000 (2000-01-04) * column 1, line 61 - column 2, line 22 *	1	
			TECHNICAL FIELDS SEARCHED (Int.Cl.7)
			F04B
The present search report has been drawn up for all claims			
Place of search Munich		Date of completion of the search 13 October 2004	Examiner Fistas, N
<p>CATEGORY OF CITED DOCUMENTS</p> <p>X : particularly relevant if taken alone Y : particularly relevant if combined with another document of the same category A : technological background O : non-written disclosure P : intermediate document</p> <p>T : theory or principle underlying the invention E : earlier patent document, but published on, or after the filing date D : document cited in the application L : document cited for other reasons & : member of the same patent family, corresponding document</p>			

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**ANNEX TO THE EUROPEAN SEARCH REPORT
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EP 02 01 6310

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The members are as contained in the European Patent Office EDP file on
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13-10-2004

Patent document cited in search report		Publication date	Patent family member(s)	Publication date
EP 1081378	A	07-03-2001	JP 2001073939 A	21-03-2001
			EP 1081378 A2	07-03-2001
			US 6358017 B1	19-03-2002

EP 1033489	A	06-09-2000	JP 2000249050 A	12-09-2000
			EP 1033489 A2	06-09-2000

US 6010312	A	04-01-2000	DE 19733099 A1	12-02-1998
			FR 2752020 A1	06-02-1998
			JP 10103249 A	21-04-1998

EPO FORM P458

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